2004 Water Use Efficiency Grant Proposal

for the

Orland Project Regulating Reservoir Feasibility Investigation

Submitted by the
Orland Unit Water Users Association

To the
California Department of Water Resources

Pursuant to the

Final 2004 Water Use Efficiency Proposal Solicitation Package

Section B:
Research and Development; Feasibility Studies, Pilot or Demonstration Projects; Training, Education or Public Information; Technical Assistance

January 2005

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Abbreviations

AF	Acre-feet
CALFED	CAL FED Bay Delta Program
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
CVP	California Valley Project
DWR	Department of Water Resources
ETo	Reference Evapotranspiration
EWA	Environmental Water Account
NCWA	Northern California Water Association
NEPA	National Environmental Policy Act of 1969
O&M	Operations and Maintenance
Orland Project or Project	The Orland Project
OUWUA or Association	The Orland Unit Water Users Association
PSP	Proposal Solicitation Package
Reclamation	Bureau of Reclamation
SCADA	Supervisory Control and Data Acquisition
SCF	Stony Creek Fan
SVWMP or Phase 8	Sacramento Valley Water Management Program
SWRCB	State Water Resources Control Board
TCC	Tehama-Colusa Canal

I. Project Information Form

Applying for: ❑ Urban ☒ Agricultural

1. (Section A) Urban or Agricultural Water Use Efficiency Implementation Project
   - ❑ (a) implementation of Urban Best Management Practice, #_____
   - ❑ (b) implementation of Agricultural Efficient Water Management Practice, #_____
   - ❑ (c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # if applicable _____
   - ❑ (d) Specify other: _____

2. (Section B) Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance
   - ☒ (e) research and development, feasibility studies, pilot, or demonstration projects
   - ❑ (f) training, education or public information programs with statewide application
   - ❑ (g) technical assistance
   - ❑ (h) other

3. Principal applicant (Organization or affiliation): Orland Unit Water Users Association

Project Title: Orland Project Regulating Reservoir Feasibility Investigation

5. Person authorized to sign and submit proposal and contract:

Name, title: Steve Butler

Mailing address: 717 5th Street
Orland, CA 95963

Telephone: 530-865-4194

Fax: 530-865-0162

6. Contact person (if different):

Name, title: Rick Massa, Manager

Mailing address: 828 Eighth St.
Orland, CA 95963

Telephone: 530-865-4126

Fax: 530-865-7631

E-mail: ouwua@glenncounty.net

7. Funds requested (dollar amount): $168,153.00

(from Table C-8, column II)

8. Applicant funds pledged (dollar amount): $8,000.00

9. Total project costs (dollar amount): $176,153.00

(from Table C-1, column II, row I)

10. Is your project locally cost effective?

Locally cost effective means that the benefits to an entity (whether in dollar terms or qualitatively) of implementing a program exceed the costs of that program within the boundaries of that entity.

(If yes, provide information that the project in addition to Bay-Delta benefits meets one of the following conditions: board transferable benefits, overcome implementation barriers, or accelerate implementation)

❑ (a) yes

☒ (b) no

11. Is your project required by regulation, law or contract

if no, your project is eligible ❑ (a) yes

if yes, the project is eligible if it is not currently requires ☒ (b) no

Provide a description of the regulation, law or contract and explanation of why the Project is not currently required

12. Duration of project (month/year to month/year): 12/2005 – 6/2007

13. State Assembly District where the project is to be conducted: District 2

14. State Senate District where the project is to be conducted: District 4

15. Congressional district(s) where the project is to be conducted: District 2

16. County where the project is to be conducted: Glenn County

17. Location of project (longitude and latitude) -122.192169, 39.747758

18. How many service connections in your service area (urban)? Not Applicable

19. How many acre-feet of water per year does your agency serve? 102,080 AF

20. Type of applicant (select one):

- ❑ (a) City
- ❑ (b) County
- ❑ (c) City and County
- ❑ (d) Joint Powers Authority
- ❑ (e) Public Water District
- ❑ (f) Tribe
- ❑ (g) Non Profit Organization
- ❑ (h) University, College
- ❑ (i) State Agency
- ❑ (j) Federal Agency
- ☒ (k) Other
  - ❑ (i) Investor-Owned Utility
  - ☒ (ii) Incorporated Mutual Water Co.
  - ❑ (iii) Specify _____

21. Is applicant a disadvantaged community? If 'yes' include annual median household income.

(Supporting documentation in Attachment 1)

- ☒ (a) yes, $31,751 annual median household income
- ❑ (b) no

2004 Water Use Efficiency **Proposal Solicitation Package**
Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant;

The applicant will comply with all terms and conditions identified in this PSP if selected for funding; and

The applicant has legal authority to enter into a contract with the State.

Signature

Steve Butler, President
Name and title

12-20-04
Date

III. Statement of Work, Section 1: Relevance and Importance

The relevance and importance of the proposed project is described in this section, preceded by a summary of the overall proposal and a brief description of the Orland Project.

Proposal Summary

The Orland Unit Water Users Association (OUWUA or Association) is applying for grant funds under Section B of the 2004 Agricultural Water Use Efficiency Program to investigate the feasibility of constructing one of five regulating reservoirs that have been identified through previous investigation. The investigation would culminate in preparation of near-final designs and cost-estimates, positioning the Association to proceed with implementation as soon as construction revenues are made available from water transfers or other sources. The investigation would feature a strong monitoring and assessment component to provide reliable estimates for potential water savings *before* the reservoir is constructed. The investigation would serve as a demonstration of how to conduct a verification-based planning process, thereby positioning the Association to proceed with planning of additional regulating reservoirs.

Constructed between 1907 and 1918, the Orland Project (or Project) consists of about 20,000 acres in northern Glenn County (Figure 1). The Project diverts roughly 100,000 acre-feet (AF) of water from Stony Creek in most years, subject to shortages in only the driest years. The open canal distribution system has undergone minimal rehabilitation and no modernization from its original form, and today is not capable of conveying water efficiently or delivering water as needed by modern on-farm irrigation systems. Consequently, the Project operates far below its potential in terms of agricultural productivity and water use efficiency.

The OUWUA operates and maintains the Project under contract with the federal government. The Association recognizes the need for system modernization through implementation of water use efficiency measures, including regulating reservoirs, system automation, canal lining (or pipelines) and improved flow measurement. These improvements are being aggressively pursued in the context of an integrated water management program that features conjunctive water management, reservoir reoperation and strategic water transfers, along with water use efficiency measures.

The benefits that will result from the integrated water management program include improved local water supply reliability, improved service to Project customers and the development of new water supplies for strategic transfer. Transfers could be made to agricultural or urban water user, the environment, or to fulfill the OUWUA's Phase 8 obligations, contributing significantly to the expansion of the statewide water supply.

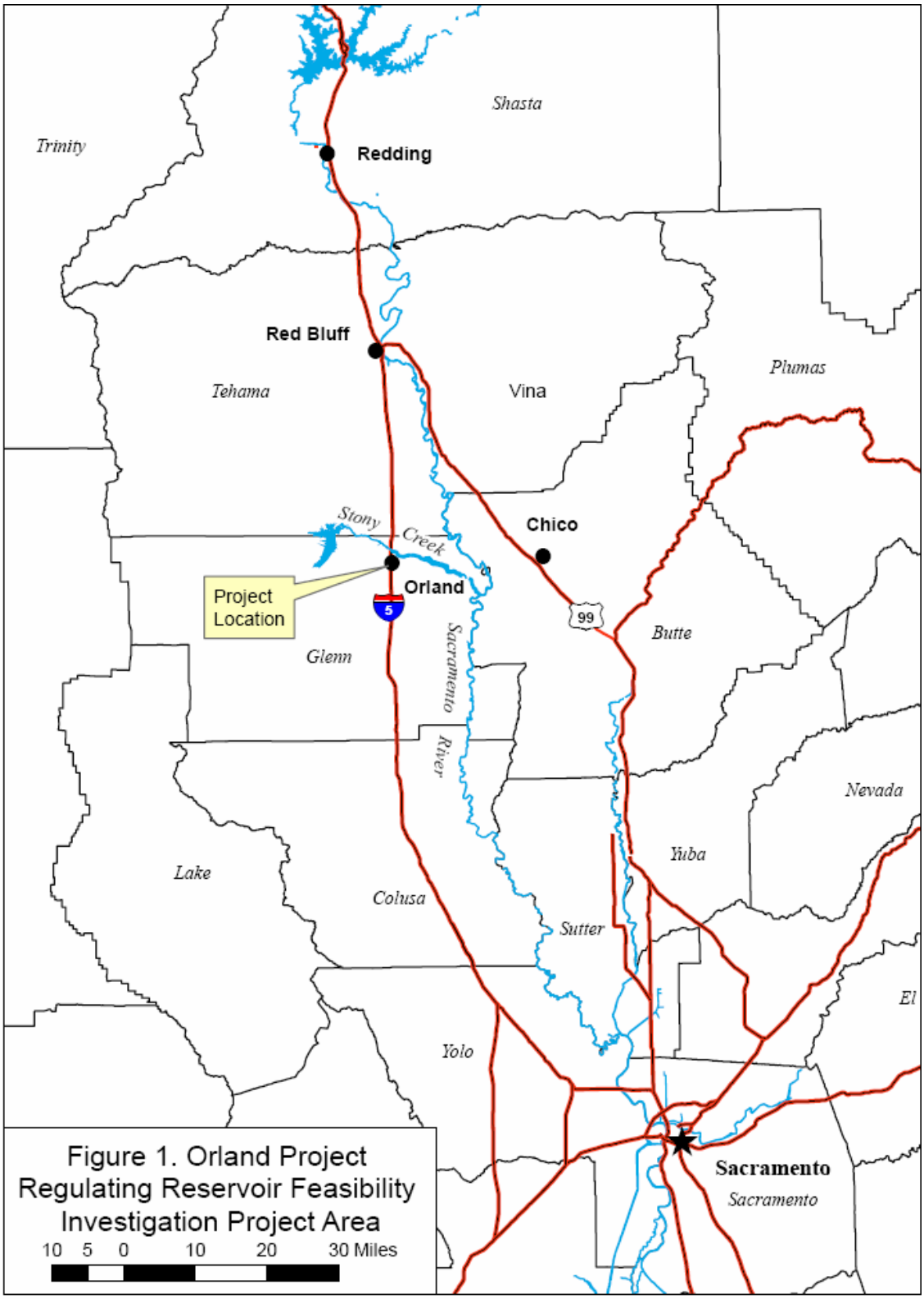


Figure 1. Orland Project Regulating Reservoir Feasibility Investigation Project Area

Orland Project Description

The Orland Project was authorized in 1907 and is one of the oldest federal Reclamation project in California. The Project is located in the north eastern part of Glenn County (Figure 1). The Project's water supply is derived from Stony Creek, a major westside tributary to the Sacramento River near the town of Orland. East Park Reservoir and Stony Gorge Reservoir comprise the Projects storage infrastructure. East Park Reservoir with a capacity of 50,620 AF was completed in 1910, and Stony Gorge Reservoir with a capacity of 50,350 AF was completed in 1928. Water is distributed throughout the project area by a system of open channels and pipelines. There are 104 miles of concrete lined canals, 14 miles of unlined canals, and 7 miles of pipelines. A majority of the system was in place by 1911. The Project estimates that roughly half of the lined canals in the project are in poor condition and in need of repair or relining as described in the OUWUA Distribution System Modernization and Water Conservation Project funded by CALFED completed in 2003.

In 1963, Black Butte Reservoir was constructed on Stony Creek by the U.S. Army Corps of Engineers, downstream of the Orland Project reservoirs, primarily as a flood control facility. Black Butte has a total capacity of 143,700 AF, 38,000 AF of which was allocated to conservation storage for the California Valley Project (CVP) in 1970. The document titled "Providing for the Exchange of Water" describes the future of integrated operations of the Project with the CVP with regards to exchange of storage space and accounting for water.

The Orland Project was operated and maintained by the Bureau of Reclamation (Reclamation) until 1954, at which time Reclamation contracted with the OUWUA to take over operations and maintenance (O&M) responsibilities. Project water rights include pre-1914 rights and rights held by Reclamation. The Angle Decree specifies the pre-1914 water rights available for use by lands in the Orland Project. These rights are summarized as:

- Direct diversion rights to 279 cfs, not to exceed 85,050 AF, from March 15 to October 15
- 51,000 AF of year-round storage rights in East Park Reservoir

Additionally, the USBR has rights to water under the State Water Resources Control Board of License No. 2652, issued in 1944 following the filing of Application No. 2212 in 1921 for the use of water on Project lands. The right allows for the appropriation of up to 50,200 AF of the waters of Stony Creek to storage in Stony Gorge Reservoir.

The project area includes 20,200 acres, approximately one-third of which lie north of Stony Creek and two-thirds south. Major crops include pasture (57%), orchard (30%) and field crops (9%). Project water is released from Black Butte Reservoir according to daily orders placed by the OUWUA. Southside orders are released into the Highline Canal, which feeds into the South Canal; northside orders are released into Stony Creek and rediverted about 4 miles downstream, at the North Diversion Dam, into the North

Canal. The Orland Project provides a very reliable water supply with the project area having received essentially full supplies in all years except 1976-77.

Water is distributed in open, upstream controlled canals and ditches on a rotation pattern. Rotational distribution of water generally results in over-irrigation in the spring and fall and under-irrigation in the summer. Consequently, yields are less than optimum, causing an increasing number of growers to convert from surface irrigation with Project water to drip irrigation systems supplied by private groundwater wells. Average on-farm irrigation efficiency is estimated to be about 60%.

Because farm sizes are generally small (averaging 18 acres) and stream sizes are large (6 to 10 cfs), water must be changed from one grower to the next every few hours. Because the flow changes cannot be made with perfect timing, and because there is no operational storage in the distribution system to regulate temporary flow mismatches, spillage losses are high. Most of the Project canals and laterals are concrete lined; however, the lining is old and badly cracked in most locations; consequently, seepage losses are also high. Based on past investigations, the combined loss from the distribution system has been estimated to be 20% of the flow diverted from Stony Creek, with about one-third attributed to seepage and two-thirds to spillage (CH2M Hill, 2003). As a result of the high system losses, more water is diverted from Stony Creek to meet Project demands than would be needed with a more efficient system, foreclosing on other water management and supply opportunities at the local and regional levels.

Need for the Project

The proposed project contributes to meeting critical local and regional water management needs. Project water users will be provided improved levels of service and increased water supply reliability. Reduction of system losses (combined with planned conjunctive water management and reoperation of Project reservoirs) will enable the OUWUA to contribute new water supplies to regional initiatives like the Sacramento Valley Water Management Program (SVWMP, also referred to as "Phase 8"), the Stony Creek Fan Conjunctive Water Management Program and satisfaction of specific CALFED Quantifiable Objectives. Local needs and linkages to these broader, regional activities are described in the following sections, indicating clearly that the OUWUA is seeking solution of local water management problems in a regional context, with potential for generating statewide benefits. The proposed project builds on the work completed under the OUWUA Distribution System Modernization and Water Conservation Project, which is also described.

Local Needs

The Orland Project distribution system is in urgent need of rehabilitation and modernization to increase delivery flexibility and increase conveyance efficiency. Regulating reservoirs have been identified as one of the key modernization components. The proposed investigation will provide the OUWUA with near-final plans and specifications for construction of the first of up to five regulating reservoirs to be added to the distribution system. This would allow the Association to proceed directly into construction when revenues become available from water transfers or other sources. The

addition of regulating capacity to the distribution system will allow operators to make timely and precise flow adjustments in response to conditions observed in the field. Spillage will be reduced while system responsiveness is increased, allowing farmers to adopt systems other than the existing surface flood systems, where appropriate. Reduction of system losses will also increase water supply reliability, particularly in dry years.

Sacramento Valley Water Management Program

In December 2002, the OUWUA was among more than 40 Sacramento Valley water suppliers that executed the Short-term Settlement Agreement, thereby seeking resolution of Phase 8 of the State Water Resources Control Board (SWRCB) proceedings for the Sacramento Valley. As a result of the Agreement, the SWRCB dismissed the Phase 8 process. The Short-term Settlement Agreement requires participating Sacramento Valley Water Suppliers to implement projects with the capacity to produce 185,000 AF of water that otherwise would not be available in the Sacramento River. More than 50 projects were identified in a Short-term Work Plan, including system improvement and water use efficiency measures, conjunctive management and surface water reservoir re-operation projects.

The OUWUA identified a project for the Short-term Work Plan project list. The project concept was to generate additional supplies through an integrated program of distribution system and water use efficiency improvements, re-operation of Orland Project Reservoirs and development of groundwater supplies within the Orland Project. The potential yield of the project was estimated to be up to 30,000 AF in certain year types, and therefore would have fulfilled a significant portion of the total Sacramento Valley obligation to produce additional water.

It was later recognized that the OUWUA project could not be implemented in time to meet the schedule for production of additional water according to the Short-term Settlement Agreement. Nevertheless, the OUWUA remains committed to fulfilling its obligations to the Agreement. The feasibility investigation proposed under this application would move the OUWUA closer to being able to follow through with their commitment to the Phase 8/SVWMP process.

Stony Creek Fan Conjunctive Water Management Program

The Stony Creek Fan (SCF) Conjunctive Water Management Program represents the collaborative efforts of the OUWUA, Glenn-Colusa Irrigation District and Orland-Artois Water District (collectively referred to as the SCF Partners), to seek solutions to local water management problems in a regional, cooperative context. The SCF Partners command very different water resources and have somewhat different needs. Nevertheless, they share the common objective of providing reliable, affordable water supplies to their customers as a means of anchoring surface water supplies at home and sustaining groundwater resources for the benefit of their customers and neighboring landowners in Glenn County.

Developing reliable and affordable local water supplies through conjunctive water management will require substantial investment in infrastructure, notably modernization of existing distribution system and development of new groundwater production capacity. It is anticipated that at least some of the revenue needed to pay for this infrastructure will be derived from strategic, short-term water transfers. Thus, accomplishment of local water supply objectives also contributes toward expanded regional and potentially statewide water supply.

Recognizing the potential to achieve local, regional and statewide benefits, the Department of Water Resources (DWR) has provided crucial financial support to the SCF Partnership to conduct planning activities. This support has created the opportunity for three previously rival agencies to work through and beyond their differences, to become a stable platform for regional action. Indeed, the SCF Partnership is increasingly viewed as a model for regional water management in the Sacramento Valley through State-local cooperation.

With the support of DWR, the SCF Partners have laid the foundation for implementing their coordinated water management programs. The foundation cornerstone is the SCF Feasibility Investigation, which was completed in 2004. Together with development of a comprehensive, regional groundwater model, field investigations into aquifer properties, hydrogeologic investigation by DWR Northern District and initial groundwater monitoring facilities, the Feasibility Investigation provides overall direction for water management initiatives.

With respect to the OUWUA, the Feasibility Investigation revealed how a coordinated program of water use efficiency measures, together with reservoir re-operation and groundwater development, could continue to meet local needs and develop new water supplies for transfer under the SVWMP (see above) or for other purposes. Water transfers, in turn, would generate the revenues needed to pay for desperately needed infra-structure improvements. The proposed Feasibility Investigation is an integral piece of this coordinated program. It would prepare the OUWUA to implement a distribution system regulating reservoir as soon as funding becomes available through water transfer activity or by other means.

As evidence of intent and progress, the Association is presently engaged in negotiations with representatives of the Environmental Water Account (EWA) regarding a potential 2005 pilot water transfer.

CALFED Quantifiable Objectives

The integrated program of water use efficiency improvements (including the proposed Feasibility Investigation), reservoir re-operation and groundwater development will enable the OUWUA to begin transferring modest amounts of water to the Sacramento River, while continuing to meet local needs and protecting local groundwater resources. The revenues generated by transfer will be directed into system improvements.

It is anticipated that any water transferred by the OUWUA will be made available in the Sacramento River at Red Bluff by exchange for Tehama-Colusa Canal (TCC) water. Transferred water would be released from Black Butte Dam for direct (via Orland Project canals) or indirect (via Stony Creek) delivery into the TCC, thereby reducing the TCC diversion requirement at Red Bluff.

Through the planned water exchange, the OUWUA program has the potential to address CALFED Targeted Benefit 13, which is to provide additional flow in the Sacramento River below Keswick Dam, to improve aquatic ecosystem conditions.

OUWUA Distribution System Modernization and Water Conservation Feasibility Investigation Project

The OUWUA was awarded funding for this project by DWR under CALFED Agricultural Water Conservation Program using Proposition 13 funds. The application was submitted in February 2001, work was initiated in May 2002 and the Final Report published in January 2003. The feasibility investigation provides a good foundation for understanding historical Orland Project operations and characterizing system performance.

The Final Report outlines three alternatives for distribution system upgrades, with costs and estimated cost-effectiveness ($/AF) as summarized in Table 1.

Table 1. Costs Associated with Distribution System Upgrades

Alternative	Capital Cost ($ million)	Annual Capital Cost ($ million)	O&M Cost ($ million)	Total Annual Cost ($ million)	Cost per AF water Conserved
1 – Pipeline Replacement	222	14.7	0.4	15.1	370
2 – Canal Rehabilitation	53.5	3.6	0.6	4.2	166
3 – Canal Improvement	18.5	1.2	1.1	2.3	159

From Table 1, it is evident that the least-cost alternative, in terms of cost per AF of conserved water, involves improvements that are less intensive and less expensive than those proposed in Alternative 3. The feasibility investigation evaluated the alternatives based on water conservation and capital and operating costs for planned overall system improvement. However, associating costs and water savings with the individual components was beyond the scope of the investigation. The report does not contain sufficient information to support implementation decisions on individual components of the alternatives.

The proposed Feasibility Investigation will build on the concepts established for the system improvement alternatives, but will focus on a specific feature (a regulating reservoir) and determine its specific costs and benefits. The objective will be to establish a specific project plan that can be undertaken by the OUWUA, with the confidence that certain water savings will be achieved at certain costs, and that the project will fit into a larger package of system improvements, to be implemented over time.

Project Goals and Objectives

The overarching goal of the OUWUA is to upgrade its distribution system as part of an integrated program of water management measures. The specific goal of the proposed Feasibility Investigation is to prepare the OUWUA to implement its first regulating reservoir as soon as construction funding is arranged.

The Feasibility Investigation has the following specific objectives:

- Select one regulating reservoir site from among the five sites identified in preliminary studies, to be investigated in detail
- Identify the canals and laterals whose operations would be affected by the reservoir and install measurement devices at spillage sites to provide a pre-project spillage record and basis for developing water savings estimates
- Prepare near-final designs, specifications and cost estimates of a regulating reservoir to position the OUWUA for construction
- Prepare necessary environmental documentation and permits needed to proceed with construction
- Determine the cost-effectiveness of constructing the selected regulating reservoir
- Conduct the Feasibility Investigation so that it serves as a model for future verification-based planning by the OUWUA

IV. Statement of Work, Section 2: Technical/Scientific Merit, Feasibility

The feasibility and technical adequacy, and work plan (task list, work schedule, deliverable descriptions, projected costs and environmental documentation) are described in this section.

Feasibility and Technical Adequacy

The proposed Feasibility Investigation would employ standard engineering practices and has no experimental or technically unproven elements. It does, however, feature a planning approach that ensures with sufficient reliability that the project benefits, expressed in terms of water savings, will actually be achieved. The approach is called *verification-based planning*, involving the principles of water conservation verification combined with traditional infrastructure planning. Task 4 in the following work plan describes how the estimate of project water savings would be developed.

Implementation Approach

The OUWUA has limited in-house capability to perform an investigation like the one proposed. Therefore, the approach will be to perform the investigation primarily with outside services, augmented with OUWUA forces on appropriate tasks, when manpower is available. The Association has identified a qualified civil and agricultural engineering firm to conduct the investigation, if funded.

Work Plan

The proposed Feasibility Investigation would be accomplished through the tasks and subtasks described in the following sections; the main tasks are:

- Task 1 – Project Management and Administration
- Task 2 – Conduct Site Reconnaissance, Screening & Selection
- Task 3 – Define Operations Procedures and Benefit Zone
- Task 4 – Develop Water Conservation Estimate
- Task 5 – Conduct Topographic Survey and Geotechnical Investigation
- Task 6 – Environmental Documentation and Permitting
- Task 7 – Prepare Near-final Reservoir Design

Task 1 – Project Management and Administration

Objective: Accomplish the work described in the work plan on schedule and within identified budgets. Facilitate coordination and communication among project participants to ensure the smooth flow of work. Prepare all project reports. Conduct outreach to inform and involve stakeholders and interested parties.

Description of Work:

Subtask 1.1 Provide Technical Coordination and Project Management – The Project Manager will be responsible for providing overall project management and direction and for providing day-today coordination among technical project staff members.

Subtask 1.2 Prepare and Submit Quarterly Reports – The Project Manager will prepare quarterly fiscal and programmatic reports to DWR, as specified in the Grant Agreement. These will be submitted to and reviewed by OUWUA management before being submitted to DWR.

Subtask 1.3 Review and Submit Technical Memorandums – The Project Manager will review all technical memorandums prepared by technical project staff. Memorandums will be reviewed by OUWUA management and then forwarded to DWR.

Subtask 1.4 Prepare and Submit Comprehensive Final Report – The Project Manager will be responsible for preparing the Final Comprehensive Report near the end of the project. Following review by the OUWUA Board and management, a draft report will be submitted to DWR for review. DWR comments will be incorporated into the Final Comprehensive Report.

Task 2 – Conduct Site Inspections, Screening & Selection

Objective: Select one reservoir site for final design from among the five preliminary sites identified in the 2003 OUWUA Distribution System Modernization and Conservation Project.

Description of Work:

Subtask 2.1 Review Available Information and Data – Assemble and review available data and information for the five preliminary reservoir sites, including maps, documents, historical flow data and operations records. Identify additional potential reservoir sites that warrant consideration, if any.

Subtask 2.2 Conduct Site Inspections – Coordinate with OUWUA staff to identify and contact land owners. Schedule and conduct site inspections; interview landowners.

Subtask 2.3 Screen and Rank Preliminary Sites – Compare alternative sites on the basis of the following factors, to the extent possible with available information, or information easily collected:

- Site size and suitability for a reservoir
- Access and ease of construction
- Suitability of site soils and materials for construction
- Availability of grid power
- Potential for water savings
- Existing land use/zoning and cost

- Landowner's willingness to cooperate
- Potential for environmental impact

Develop criteria for site selection and apply the criteria to screen and rank the sites on a preliminary basis. Conduct an informal workshop with OUWUA staff to review the criteria and preliminary ranking and allow staff to provide additional site information. Select a preferred site for completion of the investigation.

Deliverable: Technical Memorandum #1, documenting the work completed in Task 2, along with the criteria and rationale used to select the preferred reservoir site.

Task 3 – Define Operations Procedures and Benefit Zone

Objective: The objective of this task will be to define the procedures for operating the proposed reservoir and identify the portion of the system that will benefit operationally from addition of the reservoir, in terms of additional delivery flexibility and spillage reduction.

Description of Work:

Subtask 3.1 Characterize Existing System Operations – Field and office staff will be interviewed to characterize existing procedures for water ordering and delivery and day to day operation of the distribution system, both generally and in the area served by the reservoir. Flow lag times, procedures for transferring water between users, night operations, and other factors will be examined in detail. Existing levels of service will be characterized and causes of spillage identified.

Subtask 3.2 Install Spill Measurement Sites – Measurement sites will be installed at key spillage locations (see Subtask 3.4 below) to develop an existing annual spillage estimate. The measurement sites will collect one year of data to be used as a pre-project spillage conditions in the water conservation estimate (Task 4). The measurement sites will include data logger, stilling well and measurement structure.

Subtask 3.3 Characterize Future (With-Reservoir) System Operations – Again working with field and office staff, modified operations procedures will be developed for "with-reservoir" conditions. It is anticipated that the reservoir will allow more frequent adjustment of flows in response to observed spillage and to flow changes requested by growers. Different reservoir capacities will be investigated.

Subtask 3.4 Define Operations Benefit Zone – Based on the "with-reservoir" operations procedures defined in the foregoing subtask, delineate the portion of the system that will benefit operationally from addition of the reservoir. This will include identification of the farm turnouts where delivery flexibility will be increased and the lateral spillage points where operational discharges will be reduced.

Deliverable: Technical Memorandum #2 will document the operations concepts developed for the reservoir, including a map delineating the land area and laterals that will benefit, the spillage measurement program and data collected.

Task 4 – Develop Water Conservation Estimate

Objective: The objective of this task is to develop a quantitative estimate of project water savings, including reduction in on-farm losses due to increased delivery flexibility and reduction of spillage due to the ability to make more frequent flow changes.

Description of Work:

Subtask 4.1 Analyze Spillage – Flow records of spillage collected in Subtask 3.2 will be analyzed for the laterals in the benefit zone. The analysis will determine the quantity of water lost from the system under existing operations and the driving forces causing spillage. The latter will be revealed by plotting spillage flow frequency distributions. Tendencies toward small, frequent flows indicate that operators are using excess carriage water, while tendencies toward large, infrequent flows indicate problems with passing water from one grower to the next.

Subtask 4.2 Synthesize With-project Spillage Volumes. With-project estimates of spillage flows will be synthesized from pre-project spillage records (Subtask 3.2), including actual time series and flow frequencies, together with system operations analyses. The spillage reduction that can be expected due to the reservoir is the difference between the existing spillage estimate and the with-project estimate.

Subtask 4.3 Characterize Existing and With-project On-farm Efficiency – A total of no more than ten existing on-farm irrigation systems will be inspected and the associated growers interviewed. Based on these observations and interviews, together with analysis of available information and projections of reservoir operations, estimates will be developed for average on-farm irrigation efficiency under existing and future (with-project) conditions. The efficiency differential will be used to compute the on-farm water savings that can be expected from the reservoir.

Subtask 4.4 Compute Total Project Water Savings – The total project water savings will be computed as the sum of the estimated spillage reduction and on-farm savings. Confidence intervals will be established for the estimate so that the likelihood of achieving the project benefits can be assessed.

Deliverable: Technical Memorandum #3 documenting development of the project water conservation estimate.

Task 5 – Conduct Topographic Survey and Geotechnical Investigation

Objective: Collect the topographic and geotechnical information needed to design the reservoir.

Description of Work:

Subtask 5.1 Conduct Topographic Survey – A topographical survey of the selected reservoir site will be made to enable reservoir design. This will include the information needed to compute earthwork cut and fill volumes and to develop the hydraulic design of the reservoir inlet and outlet. If sufficient elevation drop is available, the reservoir will use gravity flow in and out; however, if the drop is insufficient, the reservoir might use a pump outlet.

Subtask 5.2 Conduct Geotechnical Investigations. A geotechnical investigation will be conducted to determine excavation conditions and to characterize the construction qualities of local materials. Test excavations may be made with a backhoe or drill rig. Samples will be taken and sent for laboratory analysis to determine the suitability of the material for compacted earthen embankment and for a compacted earthen reservoir liner. The decision of whether to use a membrane liner will depend on the laboratory results.

Deliverable: Topographic survey data and laboratory results.

Task 6 – Environmental Documentation and Permitting

Objective: The objective of this task is to accomplish the necessary environmental compliance and permitting needed to position the OUWUA to proceed with project construction.

Discussion: Although Orland Project regulating reservoirs are an element of what is eventually intended to be an integrated program of distribution system improvements, conjunctive water management and reservoir re-operation, that program has not yet been sufficiently defined to determine what level of programmatic environmental compliance is warranted. Therefore, the regulating reservoir will be regarding as a stand-alone project and environmental compliance prepared accordingly, pending development of a comprehensive water management program and related environmental documentation.

Because the Orland Project facilities are owned by the federal government, federal approval will be required to actually construct the proposed reservoir. The act of approving the project will probably trigger NEPA requirements. The OUWUA is not a public agency, so it is not clear at this time whether CEQA would be apply and, if it does, who would act as lead agency. These are issues to be addressed during the Feasibility Investigation.

Description of Work: It is anticipated that this task will be outsourced to an environmental consulting firm. The basic tasks will be to determine whether NEPA and CEQA apply, to identify the appropriate level of documentation and to address potential environmental impacts. At this time, it is believed that the appropriate level of NEPA/CEQA compliance (if both are needed) for the project would be an Environmental Assessment/Initial Study. Potential environmental impacts that will need to be addressed include re-routing of spillage flows and effects on riparian corridors and habitats and the direct impacts of construction at the selected site.

Task 7 – Prepare Near-final Reservoir Design

Objective: Prepare materials that can be incorporated into construction contract documents for actual construction of the regulating reservoir.

Description of Work:

Subtask 7.1 Prepare Hydraulic Design – Determine the necessary storage capacity of the regulating reservoir and discharge capacities of its inlet and outlet work. This will be done using spreadsheet-based operations simulation tools. Capacities will be determined on an economic basis, seeking to identify the optimum combination of project costs and benefits. This task will encompass upstream and downstream portions of the system and will address any bottlenecks identified by the operations analysis.

Subtask 7.2 Prepare Site Grading & Earthwork Plan – Specify the horizontal coordinates and dimensions of the reservoir. Specify critical water surface and embankment elevations, allowing for freeboard and inlet and outlet losses. Prepare a site grading plan and compute earthwork quantities.

Subtask 7.3 Prepare Structural Designs – Design the inlet and outlet structures and any modifications needed to upstream or downstream laterals. Prepare design drawings showing structure dimensions and elevations, size and placement of reinforcing steel, and other construction information.

Subtask 7.4 Prepare Mechanical, Electrical & SCADA Designs – Work with OUWUA staff to develop a reservoir operation and control plan, including provisions for remote monitoring and control using SCADA (Supervisory Control and Data Acquisition) technology. Develop specifications for control gates, motorized gate operators, sensors, programmable logic controllers, radios, enclosures, power systems and related equipment.

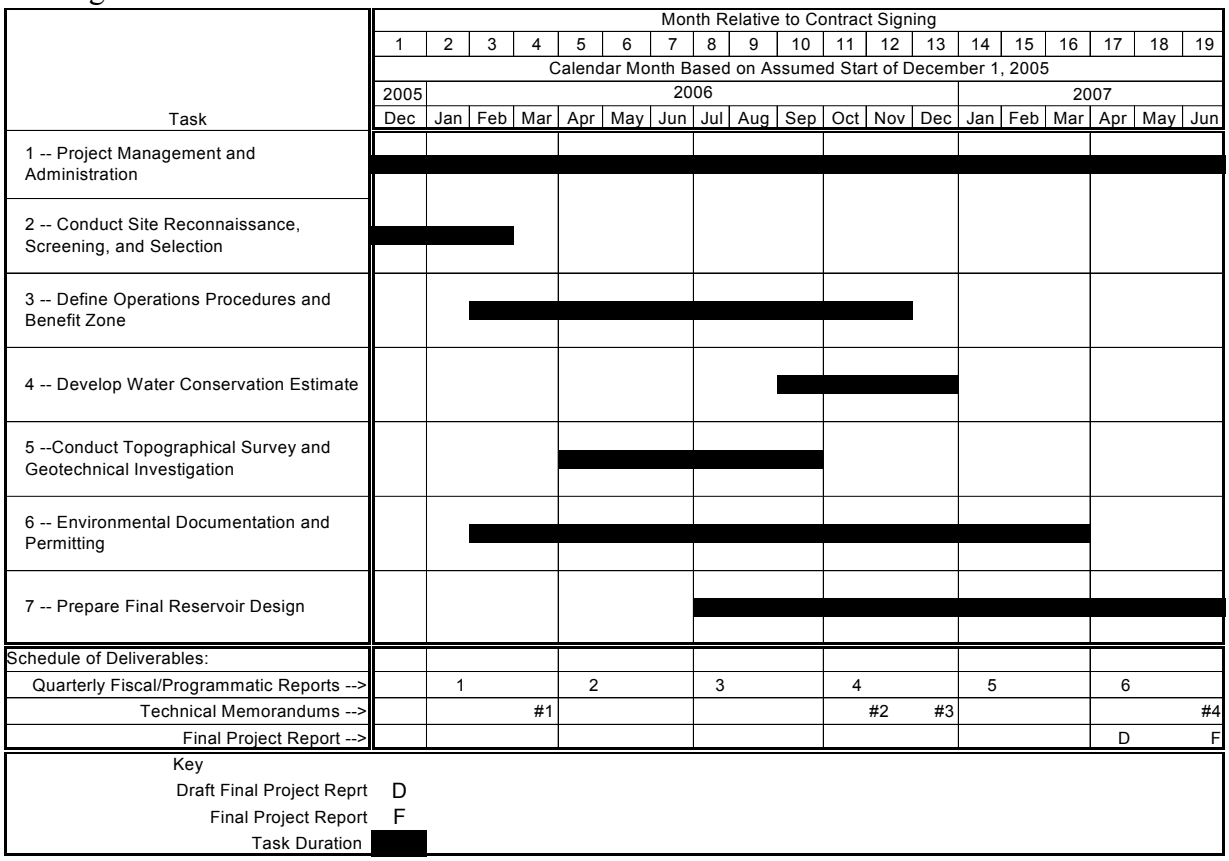
Subtask 7.5 Prepare Construction Details – Prepare descriptions and illustrations for any construction details not covered by the above designs.

Deliverable: Technical Memorandum # 4 (Final Design Report) – Prepare a design report, consisting of design drawings, construction specifications and descriptive narrative. (Construction legal and contractual materials will not be included.)

Work Schedule

A bar chart showing the project schedule is shown below (Figure 2) based on a Project start date of December 1, 2005, as indicated in the PSP. Project Management (Task 1) is shown as a continuous activity throughout the duration of the project. Task 2 (Site Reconnaissance, Screening and Selection) would be initiated immediately and concluded

Figure 2. Proposed Schedule for the Orland Project Regulating Reservoir Feasibility Investigation



within 3 months. Task 3 would be started as soon as the selected site was identified in Task 2, so that the necessary flow measurement sites could be identified and installed prior to the start of the 2006 irrigation season (typically mid- to late-March). Flow measurement activities under Task 3 would continue throughout the irrigation season, concluding in November. As the irrigation season was winding down, work on developing the project water conservation estimate (Task 4) would occur, concluding in December 2006.

Topographic surveys and geotechnical investigations under Task 5 would be started in the spring of 2006, after the final reservoir site was selected. Once those activities were substantially complete, work on the actual reservoir design (Task 7) would begin. Environmental compliance activities would also begin in the winter of 2006, as soon as the final reservoir site was selected, and would continue for approximately 14 months, concluding in March 2007. The design work under Task 6, including preparation of the Comprehensive Final Report, is scheduled to last until the completion of the Project in June 2007.

Completion dates for Project deliverables are identified in Figure 2 and summarized below in Table 2. The deliverables include 6 quarterly reports, four technical memorandums and the Comprehensive Final Report (draft and final). Dates for delivery

of environmental documents are not shown, since they cannot be predicted with certainty at this time.

Table 2. Schedule for Completion of Project Deliverables

Project Reports/Deliverables	Completion Date
1st Quarterly Report	January-06
TM #1 (Task 2 Reservoir Site Selection)	March-06
2nd Quarterly Report	April-06
3rd Quarterly Report	July-06
4th Quarterly Report	October-06
TM #2 (Task 3 Reservoir Operations Plan)	November-06
TM #3 (Task 4 Water Conservation Estimate)	December-06
5th Quarterly/Annual Report	January-07
6th Quarterly Report	April-07
Comprehensive Final Report (Draft)	April-07
TM #4 (Task 7 Design Report)	June-07
Comprehensive Final Report (Final)	June-07

Estimated Project Costs

The cost of the proposed Feasibility Investigation was developed by estimating labor requirements and direct expenses on a subtask by subtask basis (Table 3). The total Project cost is estimated to be $176,153, including direct costs of $19,200 under Task 3 for establishing flow measurement at 6 lateral spillage sites and $15,000 under Task 6 for outsourcing of environmental compliance and permitting services.

Project costs are discussed further in Section IX.

Table 3. Orland Project Regulating Reservoir Feasibility Investigation Detailed Budget

	Labor Costs						Direct Costs					
	Labor Hours by Staff Level						Cost Item					
	Project Manager/ Principal Engineer	Senior Professional Engineer	Professional Engineer/ GIS Specialist	Staff Engineer/ Surveyor	Project Assistant/ Secretarial		Vehicle	Computer	Communications	Miscellaneous/ Other		
	Hourly Rates					Labor Costs Subtotal ($)	(miles @)	(hours @)	at cost	at cost	Direct Costs Subtotal ($)	Total Cost ($)
Project Task/Subtask	$150	$120	$96	$80	$45		$0.40	$7.00				
1.1 -- Provide Technical Coordination and Project Management	114	0	0	0	40	$18,900						
1.2 Prepare and Submit Quarterly Reports	12	0	48	0	24	$7,488						
1.3 -- Review and Submit Technical Memorandums	12	0	0	0	8	$2,160						
1.4 -- Review and Submit Comprehensive Final Report	24	0	0	0	0	$3,600						
Task 1 Subtotals	162	0	48	0	72	$32,148	500	113	$135	$500	$1,625	$33,773
2.1 – Review Available Information and Data	2	2	0	24	4	$2,640						
2.2 – Conduct Site Inspections	16	0	0	16	4	$3,860						
2.3 – Screen and Rank Preliminary Sites	2	2	0	16	4	$2,000						
Task 2 Subtotals	20	4	0	56	12	$8,500	500	55	$50	$150	$786	$9,286
3.1 – Charaterize Existing System Operations	16	24	0	40	4	$8,660						
3.2 – Install Spill Measurement Sites	4	0	32	40	0	$6,872						
3.3 – Charaterize Future (With-Reservoir) Operations	8	8	0	16	4	$3,620						
3.4 – Define Operations Benefit zone	4	4	0	16	4	$2,540						
Task 3 Subtotals	32	36	32	112	12	$21,692	500	90	$50	$19,200	$20,077	$41,769
4.1 – Analyze Historical Spillage	2	6	2	40	4	$4,592						
4.2 – Synthesize With-project Spillage Volumes	2	6	2	40	4	$4,592						
4.3 – Charaterize Existing and With-project On-farm Efficiency	8	16	2	32	4	$6,052						
4.4 – Compute Total Project Water Savings	2	4	2	16	4	$2,432						
Task 4 Subtotals	14	32	8	128	16	$17,668	500	73	$50	$5,787	$6,547	$24,215
5.1 – Conduct Topographical Survey	2	0	0	64	2	$5,510						
5.2 – Conduct Geotechnical Investigation	2	0	16	2	2	$2,086						
Task 5 Subtotals	4	0	16	66	4	$7,596	200	36	$50	$4,000	$4,382	$11,978
6 – Environmental Documentation and Permitting	16	0	0	0	4	$2,580						
Task 6 Subtotals	16	0	0	0	4	$2,580	0	12	$50	$15,000	$15,134	$17,714
7.1 – Prepare Hydraulic Design	2	4		24	2	$2,790						
7.2 – Prepare Site Grading and Earthwork Plan	2		32	16	2	$4,742						
7.3 – Prepare Structural Design	2		80	40	2	$11,270						
7.4 – Prepare Mechanical, Electrical & SCADA Designs	2	64		8	2	$8,710						
7.5 – Prepare Construction Details	2	16		8	2	$2,950						
7.6 – Prepare Engineer's Cost Estimate	6	32		8	2	$5,470						
Task 7 Subtotals	16	116	112	104	12	$35,932	440	180	$50	$0	$1,486	$37,418
Totals	264	188	216	466	132	126,116	2,640	558	$435	$44,637	$50,037	$176,153

V. Statement of Work, Section 3: Monitoring and Assessment

A strong, effective monitoring and assessment component is embedded in this project through the application of *verification-based planning,* a technique that fuses traditional facilities planning with water conservation verification procedures. This technique ensures that steps are taken in project planning to measure and record pre-project conditions and performance levels, which serve as a basis for characterizing system performance both with and without the project. The difference in performance between these two conditions, in this case concentrating on system spillage and delivery flexibility, provides reliable estimates of the project's likely water savings

Together with reliable estimates of project costs, the project's cost-effectiveness can be estimated *before* the project is actually built. Measurement continued into the post-project period will be used to validate the synthesized with-project characterizations, providing reliable estimates of actual verified water savings. Specific monitoring and assessment measures are discussed below; verification-based planning is discussed in greater detail in Section VIII, Innovation.

Pre-project & Data Baselines and Monitoring Methodologies

Distribution System Spillage

Pre-project conditions will be established by measuring actual spillage from the laterals that will be affected by the regulating reservoir, during the 2006 irrigation season. Recognizing that the hydrologic conditions that occur in 2006 will not be representative of the range of water supply and hydrologic conditions that occur over time, the 2006 spillage records will need to be adjusted to reflect that range of conditions. The adjustment process will involve review and analysis of historical operations records to determine whether system losses are correlated with water supply conditions.

Conventional, proven methodologies will be used to measure, record and quality-control lateral spillage. This will include use of standard measurement structures where possible, with a preference for broad-crested and sharp-crested weirs as primary flow measurement devices. Non-standard structures might also be employed, provided that consistent stage-discharge functions can be developed through current metering.

The plan is to automate data recording at standard intervals of about 15 minutes, and in no case more than hourly. This will provide estimates for calculating monthly flow volumes for the water balance that are as reliable as the error in the basic measurement, and will enable analysis of hour-to-hour flow patterns needed to design spillage reduction measures.

Flow measurement sites will be visited at least bi-weekly to check site conditions, swap data packs (unless and until sites are added to SCADA systems) and conduct site maintenance.

On-farm Irrigation Efficiency

It is also necessary to establish a baseline of on-farm irrigation system performance, since it is anticipated that the improved delivery service made possible by the reservoir will eventually lead to adoption of improved on-farm systems and practices. As discussed in the task descriptions, this will be done by inspecting existing on-farm irrigation systems and interviewing the associated growers. Based on these observations and interviews, together with analysis of available information and projections of reservoir operations, estimates will be developed for average on-farm irrigation efficiency under existing and future (with-project) conditions. The efficiency differential will be used to compute the on-farm water savings that can be expected from the reservoir.

Anticipated Accuracy

It is anticipated that spillage flows can be established within 10% error at the 95% confidence level, assuming use of standard or rated flow measurement structures. A systematic process will be used for assigning confidence levels to estimates of water savings computed from measured values.

Evaluating Success in Achieving Project Goals and Objectives

The Feasibility Investigation will provide the basis for quantifying the potential and achievable volumes of water savings associated with the selected reservoir site and specific design.

Data Handling, Storage and Reporting

Flow data will be uploaded into Access databases, with quality control algorithms applied to check for erroneous data. Data gaps will be filled with appropriate estimating techniques, so that flow volume estimates are complete and representative. The flow, delivery and system loss data gathered using data loggers will be quality-controlled and stored at the OUWUA headquarters. It will be made available to interested agencies and parties upon request. Quarterly and annual reports of the project costs and benefits will be prepared and distributed to the interested parties.

Monitoring and Evaluation Costs

Monitoring and evaluation costs include $19,200 for installation of flow measurement equipment and structures plus about $46,800 in labor and other incidental costs under Tasks 3 and 4. The total cost for monitoring and evaluation is therefore $66,000, or 37% of the total project cost. This reflects the higher cost associated with verification-based planning; however, these efforts increase the confidence that the project will actually accomplish its targeted goals to improve local water supply reliability and diversion reduction for improved fish passage conditions.

VI. Qualifications of the Applicants and Cooperators

Project Manager

Mr. Rick E. Massa is the project manager for the proposed Feasibility Investigation. Mr. Massa has been the general manager of the OUWUA since 1997. Working under the direction of the Board of Directors, Mr. Massa is responsible for all aspects of operation and maintenance of the Orland Project, with an annual budget of $1,000,000. During his tenure with the OUWUA, Mr. Massa has participated in and managed several projects involving consultant services, such as would be used for this project. Mr. Massa's resume is presented in Attachment 2.

External Cooperators

As previously mentioned, the OUWUA has limited in-house capability to execute a major investigation in addition to performing regular operations and maintenance tasks. Therefore, the approach will be to perform the investigation primarily with outside services, augmented with OUWUA forces on appropriate tasks, when manpower is available. The Association has identified a qualified civil and agricultural engineering firm to conduct the investigation, if funded.

Previous Water Use Efficiency Grant Projects

In response to the January 2001 CALFED Water Use Efficiency Program grant solicitation, The OUWUA applied for and received funding to conduct a Regional Water Use Efficiency Investigation. The conceptual-level conducted in association with the Tehama-Colusa Canal Authority and looked at alternatives for generating new water supplies through reservoir reoperation and construction of regional conveyance facilities.

OUWUA was awarded funding on May 2002 for the OUWUA Distribution System and Modernization Water Conservation Project Feasibility Investigation from the DWR under the CALFED Agricultural Water Conservation Program using Proposition 13 funds. That planning effort examined three approaches for rehabilitation of the Orland Project distribution system, including a complete pipeline replacement and two scenarios for improving the existing open canal system.

Although called a feasibility investigation, the study was necessarily performed at the reconnaissance level of detail. The study revealed the huge costs associated with a complete pipeline replacement of the distribution system, steering the OUWUA toward rehabilitation of the existing system. It identified the five sites for regulating reservoirs that serve as the starting point for the proposed Feasibility Investigation.

Status as a Disadvantaged Community

The OUWUA project area covers a total of 20,200 acres in northern Glenn County, with most landowners residing in or near the area. The annual median household income in Glenn County in 2002 was $31,751 according to the United State Census Bureau (Attachment 1). A disadvantaged community is defined as having an annual median

household income that is less than 80 percent of the statewide annual median household income (eighty percent of the statewide annual medium household income for 2002 is $38,000). The annual median household income for Glenn County in 2002 is roughly $6,000 less that the statewide median household income. In view of that, it can be classified as a disadvantaged community.

VII. Outreach, Community Involvement and Acceptance

The proposed Feasibility Investigation addresses modernization of the OUWUA distribution system for the purpose of upgrading water delivery service and increasing local and regional water supply reliability. Thus, the project has been designed with a two-part outreach component, one concentrating on involving the local landowner community and another to provide information to a broader set of interests.

Community Involvement

The OUWUA has a long tradition of communication with its members through regular and special meetings and newsletters. These mechanisms have proven to be both effective and easily orchestrated and will be relied on to involve community members in the proposed project. Outreach began with the Association on October 14, 2004, when the merits and requirements of preparing this proposal were discussed by the Board of Directors.

If the project is selected for funding, at least two special Board meetings would be conducted. The first would be at the project initiation to inform interested parties of the project's goal, objectives, main tasks and implementation schedule. The second would be held near the end of the project to present the findings and conclusions of the investigation. Informal meetings with landowners who might be impacted by the project would be held as needed along the way. The Associations annual meeting in February of each would also be used to inform members about the Project.

A similar pattern would be used to reach out to the entire landowner community through newsletters, with one mailing at the project outset and another at its conclusion.

Information Dissemination

Because this is a highly specific, local project, it is not anticipated that there will be widespread interest in the progress of the investigation. However, the OUWUA is pleased to be among the first water purveyors in California to apply verification-based planning to advance its water management initiatives, and intends to share that aspect of the project with the public. In this regard, the OUWUA will offer appropriate project materials for posting on websites, such as those operated by DWR or Reclamation and will freely share all project materials and data. It is planned that Comprehensive Final Report will stand as an example of how to conduct a verification-based planning effort.

Public Acceptance

The need to modernize the OUWUA distribution system is widely recognized by local landowners; therefore this project enjoys wide support for the benefits it would provide. On a broader scale, the Northern California Water Association (NCWA) lends its support to the project as demonstrated in its letter dated January 6, 2005(Attachment 3). NCWA's support reflects the fact that the OUWUA is a Phase 8 signatory and because the proposed project will move the Association closer to being able to fulfill its Phase 8 obligations.

VIII. Innovation

Regulating reservoirs have been used to improve the performance of irrigation distribution systems for decades so, on the surface, there would not appear to be anything particularly innovative about this project. However, like most conservation projects constructed by local entities, regulating reservoirs are typically constructed with little attention given to predicting and validating water savings.

For this project, the applicant intends to use a technique called verification-based planning, which combines principles of water conservation verification with traditional infrastructure planning. Verification-based planning ensures with sufficient reliability that the project benefits, expressed in terms of water savings, will actually be achieved. If all projects were planned this way, state agencies such as DWR and the CBDA could compare alternative projects in equivalent terms in the context of regional and statewide planning.

In this particular case, verification-based planning must address two aspects of conservation, one through reduction of lateral spillage and another through increased delivery flexibility, which would lead to increased on-farm irrigation efficiency. The proposed Feasibility Investigation will serve as a model for how to address regulating reservoir water savings at the planning stage.

IX. Benefits and Costs

The benefits and costs associated with the Regulating Reservoir Feasibility Investigation are discussed in this section.

Project Benefits

The benefits of this project must be viewed in the context of the OUWUA's integrated water management program, which encompasses water use efficiency to conserve water, groundwater development to augment water supplies, reoperation of project reservoirs to generate new water supplies, and strategic water transfer to generate revenue needed for program implementation. Ultimately, the Program will enable the OUWUA to improve local water supply reliability, improve service to customers and generate water supplies to fulfill obligations to the SVWMP (Phase 8) and other regional water management initiatives. Preliminary estimates are that the Orland Project could produce up to 30,000 AF of additional water supply in certain years, when all Program features are in place. This represents a major opportunity to expand statewide water while increasing local water supply reliability and protecting local groundwater resources.

It is anticipated that the OUWUA Program will be implemented over a period of years, depending on water transfer opportunities and many other factors. The immediate benefit of the proposed Feasibility Investigation is that it will position the OUWUA to implement one element of the Program's water use efficiency component as soon as sufficient revenues become available. This will set a model for a "pay-as-you-go" implementation approach and serve as an example of how to conduct verification-based modernization planning.

Estimated Project Water Savings

Preliminary estimates of Project water savings have been developed from information generated by the OUWUA's 2003 Distribution System Modernization and Water Conservation Project (Attachment 4). These estimates indicate that the addition of each regulating reservoir (five reservoirs were identified) to the Project distribution system which will result in approximately 2,550 AF of water savings, with roughly half of the savings associated with reduced operational spillage and half associated with increased on-farm irrigation efficiency. This estimate was developed specifically for one of the five reservoirs identified in the 2003 Modernization Project using 2000 and 2001 OUWUA records, historical cropping patterns, CIMIS[1] reference evapotranspiration (ETo), a root zone water balance model and Reclamation historical water use records. The assumptions, methodologies, and computations used to develop the estimate are described in detail in Attachment 4.

[1] California Irrigation Management Information System, maintained by the California Department of Water Resources.

Project Costs

Estimates of project costs were developed around the tasks presented in Section IV (see Table 2). The costs presented in Table 2 were cross-referenced with the cost categories used in Table C-1, as summarized below. Table C-1 is presented on the following page.

- *Consulting services/administration* is comprised of the portion of Task 1 associated with project management (Subtask 1.1). The cost is $18,900 or 11% of the total project cost

- *Planning/Design/Engineering* is the residual of costs not allocated to other categories. The cost is estimated to be $50,655 or 29% of the total project cost

- *Materials/Installation/Implementation* covers the cost of procuring and installing flow measurement equipment, estimated to be half of the Task 3 direct cost of $19,200, which is $9,600 or 5% of the total project cost

- *Structures* covers the construction and modification needed to establish flow measurement capability at the affected spillage sites. This accounts for the remaining 50% of the Task 3 direct cost. The cost is $9,600 or 5% of the total project cost.

- *Environmental Compliance/Enhancement* is budgeted at $17,714 or 10% of the total project cost.

- *Public Involvement* is not budgeted specifically, with the costs instead included in other task costs. This was estimated to be 3% of the total project cost, or $5,285.

- *Monitoring and Assessment* consists of Tasks 3 and 4, minus the Task 3 direct cost of $19,200 for measurement equipment and structures.

- *Report preparation* of all kinds is estimated to require 10% of the total project budget or $17,615.

As previously discussed, the project area qualifies as a disadvantaged community under the PSP criteria; therefore, no applicant cost share is required. Nevertheless, the Association has plans to contribute $8,000, or 5% of the total project cost, toward completion of the Investigation. This will be in-kind services associated with backhoe excavation for the geotechnical investigation (Planning/Design/Engineering), a newsletter mailing in support of public involvement and field work in support of monitoring and assessment.

References

CH2M HILL. 2003. *OUWUA Distribution System Modernization and Water Conservation Project Feasibility Report.* A CALFED Agricultural Conservation Program Grant Study.

Applicant: Orland Unit Water Users Association

Table C-1: Project Costs (Budget) in Dollars

	Category	Project Costs $	Contingency % (ex. 5 or 10)	Project Cost + Contingency $	Applicant Share $	State Share Grant $
	Administration[1]					
	Salaries, wages	$0		$0	$0	$0
	Fringe benefits	$0		$0	$0	$0
	Supplies	$0		$0	$0	$0
	Equipment	$0		$0	$0	$0
	Consulting services	$18,900		$18,900	$0	$18,900
	Travel	$0		$0	$0	$0
	Other	$0		$0	$0	$0
(a)	Total Administration Costs	$18,900		$18,900	$0	$18,900
(b)	Planning/Design/Engineering	$50,655		$50,655	$3,000	$47,655
(c)	Equipment Purchases/Rentals/Rebates/Vouchers	$0		$0	$0	$0
(d)	Materials/Installation/Implementation	$9,600		$9,600	$0	$9,600
(e)	Implementation Verification	$0		$0	$0	$0
(f)	Project Legal/License Fees	$0		$0	$0	$0
(g)	Structures	$9,600		$9,600	$0	$9,600
(h)	Land Purchase/Easement	$0		$0	$0	$0
(i)	Environmental Compliance/Mitigation/Enhancement	$17,714		$17,714	$0	$17,714
(j)	Construction	$0		$0	$0	$0
(k)	Other (Specify: public involvement)	$5,285		$5,285	$1,000	$4,285
(l)	Monitoring and Assessment	$46,784		$46,784	$4,000	$42,784
(m)	Report Preparation	$17,615		$17,615	$0	$17,615
(n)	**TOTAL**	$176,153		$176,153	$8,000	$168,153
(o)	Cost Share -Percentage				5	95

1- excludes administration O&M.